

DU PONT

DATA SHEET

DPM 3232

PRODUCT BCO

Surface Active Agent

NOTICE: Product BCO Surface Active Agent Causes Irritation: See Section on Personal Safety and First Aid.

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INTRODUCTION

Product BCO surface active agent is a solution of cetyl betaine (C-type) in water. It exhibits amphoteric properties in that it acts as a cationic surface active agent under acid conditions and as an anionic surface active agent under alkaline conditions. This product has a high degree of stability and is compatible in solution with a wide range of materials under acidic, neutral and alkaline conditions. It resists precipitation by a large number of metal salts, such as those of calcium, magnesium, barium, lead and aluminum.

Product BCO possesses excellent wetting, detergent, emulsifying and dispersing properties which make it of particular value in a number of dyeing applications. It is an excellent leveling agent for dyeing textiles and is useful as a leveling and re-wetting agent in the paper industry, as a dyeing assistant and degreasing agent in the leather industry and as an antistatic agent on plastic films.

PHYSICAL AND CHEMICAL PROPERTIES†

Composition	Cetyl betaine
Ionic Type	Amphoteric
Appearance	Clear liquid
Odor	Mild
Color	Yellow to dark amber
Density at 25 C (77 F)	
lb/gal	9
g/mL (Mg/m ³)	1.08
Solubility in water at 25 C (77 F)	Miscible in all proportions
Stability	
in acid solution	stable
in alkaline solution	stable
Boiling Point (760 mm Hg)	near 100 C (212 F)
Freezing Point (760 mm Hg)	near 0 C (32 F)
pH	8-10
Flash Point	>99 C (210 F)

† These properties are drawn from various Du Pont and other literature sources. Du Pont does not make any express or implied warranty that all future production will demonstrate or continue to possess these typical properties.

TABLE I
Solubility and Stability of
Product BCO in Acid and Alkaline Solutions

Medium	Solubility and Stability of Product BCO
Sulfuric Acid Solutions 70% at 88 C (190 F)	0.5% is soluble and stable and has good sudsing action after four hours.
Various acidic solutions having a pH of 5, 4, 3, and 2.	Concentrations of 0.25, 0.5, 1 and 2% are soluble and stable in each solution for at least 16 hours at room temperature.
Nitric Acid Solutions Commercial formulations having the following strengths: 36° Bé. (52.3%) 38° Bé. (56.5%) 40° Bé. (61.4%) 42° Bé. (67.2%)	0.05% in each nitric acid formulation shows no separation and no color development. It also has good sudsing action for at least a 22-hour period.
Sodium Hydroxide Solutions 0.75% 4.0 % 10.0 % 15.0 % 20.0 %	1% is soluble and stable in each solution for at least 16 hours at room temperature. Insoluble.

TABLE II
Wetting Efficiency* of Product BCO

Medium	Grams per liter of Product BCO needed for sinking in 25 seconds		
	25 C (77 F)	49 C (120 F)	71 C (160 F)
Distilled water	3.4	1.8	1.5
Hard water (100 ppm)**	2.9	1.7	1.5
Sodium hydroxide (1%)	4.5	4.1	4.3
Acetic acid (1%)	3.2	2.3	1.5

* All wetting speeds were determined by interpolation from data obtained with 5-gram cotton skeins, using a 3-gram sinker according to a modification of the A.A.T.C.C. Test Method 17.

** 100 parts per million calcium carbonate equivalent is obtained from 0.083 grams per liter of CaCl₂ plus 0.05 grams per liter of MgCl₂·6H₂O.

TABLE III
Surface Tension of
Product BCO Solutions in Water

Concentration%	dyn/cm (mN/m) 25 C (77 F)
0.004	39
0.02	35
0.04	33
0.20	33
0.40	34

PERSONAL SAFETY AND FIRST AID

Product BCO Surface Active Agent is irritating to the skin and moderately to severely irritating to the eyes. It has a low order of acute oral toxicity.

Personal Safety

Avoid contact with eyes, skin and clothing. Wash thoroughly after handling. Wear eye protection as a precaution against splashes in the eyes. Wear protective gloves when immersion of the hands in the solution becomes necessary.

First Aid

In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Call a physician. Flush skin with water.

STORAGE AND HANDLING

Product BCO is thermally stable and may be stored in its shipping container at normal indoor and outdoor temperatures. Protect the product from

freezing, which will affect the physical condition but will not damage it. If freezing does occur, thaw and mix before using.

PACKAGES

Du Pont ships Product BCO in 55-gallon (208-L) fiber containers with a polyethylene liner. DOT Hazard Classification—Not Regulated.

Due to changing governmental regulations such as those of the Department of Transportation, Department of Labor, U.S. Environmental Protection Agency and the Food and Drug Administration, references herein to governmental requirements may be superseded. Each user should consult and follow the current governmental regulations, such as Hazard Classifications, Labeling, Food Use Clearances, Worker Exposure Limitations and Waste Disposal Procedures for the product described in this literature.

For Additional Information Telephone:
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